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NO. 7050 P. 7

Serial No. 10/541,691
Atty. Doc. No. 2002P17431WOUS

REMARKS

Claims 11-24 are pending in this application. Claim 24 stands rejected under 35 USC 112, second paragraph, for lack of antecedent basis. Claims 22-24 stand rejected under 35 USC 102(b) as being anticipated by Kear. Claims 11-15 and 17-21 stand rejected under 35 USC 103(a) as being unpatentable over Kurz in view of Kear. Claim 16 stands rejected under 35 USC 103(a) as being unpatentable over Kurz in view of Kear and further in view of Caballero.

Rejection under 35 USC 112:

Claim 24 has been amended herein to replace the term "process" with the term "component", thereby overcoming the rejection under 35 USC 112, second paragraph.

Rejections under 35 USC 102:

The Applicants traverse the rejection of claims 22-24 under 35 USC 102 as being anticipated by Kear.

Claim 22 has been amended to clarify that the component includes three layers: "a substrate having at least partially single-crystal structures; an intermediate layer having no single-crystal or directional structure bonded to the substrate; and a layer material with a single-crystal structure formed on the intermediate layer." Thus, all three layers are metallurgically joined, with the substrate and layer material including single crystal structures and the intermediate layer not having a single crystal or directional structure.

In contrast, the component of Kear is not a metallurgically bonded three-layer structure until after the melted interlayer is re-solidified to form the joint. By that time, the interlayer has lost its amorphous properties, as described by Kear at column 3, lines 7-10:

Of course, any amorphous property advantages are lost as soon as a material is heated above the temperature at which the metastable phase converts to a crystalline structure.

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Further, at that time the interlayer will take on the single crystal structure of the other layers, as described by Kear at column 9, lines 44-47:

The phenomena in the joint region are such that the interdiffused interlayer will solidify epitaxially from the faying surfaces of the workpieces, which of course typically have crystalline metal structures.

Accordingly, Kear actually teaches away from the limitations of claims 22-24 because he teaches a three-layer structure wherein the intermediate layer takes on the single crystal properties of the other layers, thus the rejections under 35 USC 102 are not supported by the art and should be withdrawn.

Rejections under 35 USC 103:

The Applicants traverse the rejection of claims 11-15 and 17-21 under 35 USC 103 as being unpatentable over Kurz in view of Kear, and the rejection of claim 16 under 35 USC 103 as being unpatentable over Kurz in view of Kear and further in view of Caballero.

Independent claim 11 includes the limitations of "applying an intermediate layer where no single-crystal or directional structure occurs on the substrate; and epitaxially growing the layer material on the intermediate layer." In contrast, all layers of Kurz are formed epitaxially with the crystal growth being the same orientation as the underlying crystalline material, i.e. single crystal. (see Kurz column 1, lines 62 to column 2, line 4) Kurz specifically teaches away from any layer being formed without the crystal structure of the underlying layer, and his entire invention is directed to forming a monocrystal structure. Thus, Kurz fails as a primary reference, and the Examiner has not established a *prima facie* case for any of the obviousness rejections.

New claims:

New process claims 25 and 26 are added herein. Independent claim 25 includes the improvement that: "an intermediate layer is applied to the substrate prior to the deposition of the overlayer, wherein no single crystal or directionally grown structure is present in the intermediate layer; and wherein the intermediate layer is applied by a second material application

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process different than the first material application process; wherein the overlayer is epitaxially grown on the intermediate layer." None of the cited prior art teaches or suggests the deposition of an intermediate layer having no single crystal or directionally grown structure being deposited between two single crystal layers. Dependent claim 26 adds the further limitation that "the second material application process comprises an electro-deposition process." The cited prior art fails to teach or to suggest the use of an electro-deposition process to deposit an intermediate layer between two single crystal layers. Thus, claims 25 and 26 are believed to be allowable over the art of record.

Conclusion

The commissioner is hereby authorized to charge any appropriate fees due in connection with this paper, including the fees specified in 37 C.F.R. §§ 1.16 (c), 1.17(a)(1) and 1.20(d), or credit any overpayments to Deposit Account No. 19-2179.

Respectfully submitted,

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